

BIBLIOGRAPHY

[RICHMOND T. ZOCH, in Charge of Library]

By AMY D. PUTNAM

RECENT ADDITIONS

The following have been selected from among the titles of books recently received as representing those most likely to be useful to Weather Bureau officials in their meteorological work and studies:

Birkeland, Bernt Johannes.

Mittel und Extreme der Lufttemperatur. Mit 4 Textfiguren. Oslo. 1936. 155 p. tables, diagrs. 31 cm. (Geofysiske publikasjoner. Vol. xiv, No. 1.) Half-title: Klimatabellen für Norwegen, ausgearbeitet von dem Norwegischen meteorologischen Institut.

Conrad, V.

Oberflächentemperaturen in Alpenseen. Leipzig. 1935. p. 44-61. tables, diagrs. 22½ cm. [Sonderdruck aus "Gerlands Beiträge zur Geophysik," Bd. 46, Heft 1, 1935.]

Cooper, Frank, L.

Atmospheric potential gradient anomalies. New Haven, Conn. 1936. p. 387-394. tables, diagr. 27 cm. [From Physics, October 1936, vol. 7.]

Cramér, Harald.

Random variables and probability distributions. Cambridge [Eng.]. 1937. 120 p. 22 cm. (Half-title: Cambridge tracts in mathematics and mathematical physics. General editors: G. H. Hardy... E. Cunningham... No. 36.) Bibliography: p. 115-120.

Eckhardt, E., & Juszat, H. J.

Ausbreitung und Verlauf der Grippeepidemie 1933 in Abhängigkeit von meteorologischen und geographischen Faktoren. p. 64-91. maps, tables, diagrs. 20½ cm. Photostated. [From Zeitschrift für Hygiene und Infektionskrankheiten. Bd. 118, Heft 1. Berlin. 1936.]

Elderton, W. Palin.

Frequency curves and correlation. Third ed. Cambridge [Eng.]. 1938. 271 p. tables (part fold.), diagrs. 22½ cm.

Endrös, A.

Vibrationsbeobachtungen in den oberbayerischen Seen und analoge Erscheinungen in den Meeren. München. 1912. p. 515-578. tables, fold. diagrs. 22½ cm. [At head of title: Sitzungsberichte der Königl. bayerischen Akademie der Wissenschaften. Math.-phys. Klasse. Sonderabdruck aus Jahrgang 1912.]

Gillette, Halbert P.

Climatic cycles reflected in geological data. Des Moines. 1937. p. 340-346. 23½ cm. [Reprinted from the Pan-American geologist, vol. LXVIII, December 1937.]

Kratzer, P. Albert.

Das Stadtklima. Braunschweig. 1937. vi, 143 p. maps, tables, diagrs. 21½ cm. At head of title: Die Wissenschaft. Herausg. Wilhelm Westphal. Bd. 90.

U. S. Bureau of Standards.

Code for protection against lightning. Parts I, II, and III. Issued November 2, 1937. Washington. 1937. x, 96 p. illus. (incl. chart), 2 pl. 19 cm. (National bureau of standards handbook H21). "Supersedes M92 and H17." Bibliography: p. 84-96.

U. S. Hydrographic Office.

Naval air pilot, Central America. Corrected to July 1, 1937. Notice to aviators, No. 13, 1937. Issued by the Hydrographic office under the authority of the secretary of the navy. Washington. 1937. vi, 262 p. plates, tables, diagrs., maps (1 fold.), charts (part fold.) 23½ cm. ([Publication] No. 195). "Additions and changes will be published in the Notice to aviators issued semimonthly." p. ii.

SOLAR OBSERVATIONS

[Meteorological Research Division, EDGAR W. WOOLARD in charge]

SOLAR RADIATION OBSERVATIONS, MARCH 1938

By CHARLES M. LENNAHAN

Measurements of solar radiant energy received at the surface of the earth are made at eight stations maintained by the Weather Bureau, and at nine cooperating stations maintained by other institutions. The intensity of the total radiation from sun and sky on a horizontal surface is continuously recorded (from sunrise to sunset) at all these stations by self-registering instruments; pyrheliometric measurements of the intensity of direct solar radiation at normal incidence are made at frequent intervals on clear days at three Weather Bureau stations (Washington, D. C., Madison, Wis., Lincoln, Nebr.) and at the Blue Hill Observatory of Harvard University. Occasional observations of sky polarization are taken at the Weather Bureau stations at Washington and Madison. Measurements of the intensity of direct solar radiation through Schott color filters, for the determination of atmospheric turbidity and precipitable water vapor, are conducted at Washington and Blue Hill.

The geographic coordinates of the stations, and descriptions of the instrumental equipment, station exposures, and methods of observation, together with summaries of the data obtained up to the end of 1936, will be found in the MONTHLY WEATHER REVIEW, December 1937, pp. 415 to 441; further descriptions of instruments and methods are given in Weather Bureau Circular Q.

Table 1 contains the measurements of the intensity of direct solar radiation at normal incidence, with means and their departures from normal (means based on less than 3 values are in parentheses). At Madison and Lincoln the

observations are made with the Marvin pyrheliometer; at Washington and Blue Hill they are obtained with a recording Eppley thermopile, checked by observations with a Marvin pyrheliometer at Washington and with a Smithsonian Silver Disk pyrheliometer at Blue Hill. The table also gives vapor pressures at 8 a. m. (seventy-fifth meridian time) and at noon (local mean solar time).

During March 1938 direct solar radiation intensities averaged above normal at Washington; below normal at Lincoln during the afternoon and at Madison; and close to normal at Lincoln in the morning and at Blue Hill.

Table 2 contains the average amounts of radiation received daily on a horizontal surface from both sun and sky during each week, their departures from normal and the accumulated departures since the beginning of the year. The values at most of the stations are obtained from the records of an Eppley pyrheliometer recording on either a microammeter or a potentiometer.

During March 1938 all stations show a deficiency in the total solar and sky radiation for the month with the exception of Chicago, Ithaca, Miami, Fairbanks, New Orleans, San Juan, and Friday Harbor. The latter four stations also had an excess of total radiation during January and February.

For the determination of atmospheric turbidity and precipitable water, the intensity of direct solar radiation at normal incidence is measured, with and without color filters, by a thermopile recording on a potentiometer. The publication of table 3 is temporarily suspended, during a reinvestigation of the transmission of the filters.

No polarization measurements were made at Madison due to continual snow and ice cover, nor at Washington since the polarimeter has not yet been installed,

TABLE 1.—Solar radiation intensities during March 1938

(Gram-calories per minute per square centimeter of normal surface)

WASHINGTON, D. C.

Date	Sun's zenith distance										Local mean solar time	
	8 a. m.	78.7°	75.7°	70.7°	60.0°	0.0°	60.0°	70.7°	75.7°	78.7°		
	75th mer. time	Air mass										
		A. M.					P. M.					
		e	5.0	4.0	3.0	2.0	*1.0	2.0	3.0	4.0		5.0
Mar. 9	mm.	cal.	cal.	cal.	cal.	cal.	cal.	cal.	cal.	cal.	mm.	
Mar. 19	3.45				1.09						3.30	
Mar. 21	5.36				1.14	1.46					6.02	
Mar. 22	7.87				1.26	1.39	1.18				6.76	
Mar. 25	7.57				.97	1.14					8.81	
Mar. 28	2.36	0.80		1.10	1.36	1.49	1.19				1.88	
Means		(.80)	(.91)	(1.10)	1.16	1.37	(1.18)					
Departures		+.07	+.10	+.15	+.01	-.06	+.04					

MADISON, WIS.

Mar. 1	3.45	0.84	0.97	1.18	1.34						4.37
Mar. 2	6.02	.91	1.06	1.24	1.37	1.64					6.27
Mar. 8	2.26	1.00	1.12	1.23	1.43	1.53					2.36
Mar. 10	3.00				1.06						1.96
Mar. 17	4.57				1.36	1.57					3.99
Mar. 18	5.16	.62	.77								6.76
Mar. 21	6.76	.51	.58	.75	1.00	1.29					8.81
Mar. 30	7.87	.42	.51	.66							8.81
Means	.74	.81	.97	1.26	1.51						
Departures	-.14	-.20	-.18	-.05	-.07						

LINCOLN, NEBR.

Mar. 1	4.17	0.77	0.88	1.09	1.29						5.79
Mar. 6	1.96	1.06	1.20	1.34	1.47	1.66					1.88
Mar. 7	3.00	.90	1.03	1.16	1.33	1.56	1.31	1.15	0.98	0.82	3.81
Mar. 11	4.17	.81	.95	1.12	1.29	1.54					6.02

*Interpolated.

TABLE 1.—Solar radiation intensities during March 1938—Con.

LINCOLN, NEBR.—Continued

Date	Sun's zenith distance										Local mean solar time	
	8 a. m.	78.7°	75.7°	70.7°	60.0°	0.0°	60.0°	70.7°	75.7°	78.7°		
	75th mer. time	Air mass										
		A. M.					P. M.					
		e	5.0	4.0	3.0	2.0	1.0	2.0	3.0	4.0		5.0
mm.	cal.	cal.	cal.	cal.	cal.	cal.	cal.	cal.	cal.	mm.		
Mar. 12	6.27		.83		1.28	1.64					5.16	
Mar. 16	4.95							1.19	1.10	.99	5.36	
Mar. 17	5.16			1.19							5.79	
Mar. 19	4.37		1.00	1.06	1.31						4.37	
Mar. 20	4.57	.71	.86	1.02	1.23						5.79	
Mar. 23	4.17		.72	.92	1.28						2.87	
Mar. 24	3.99											
Mar. 25	2.77		.48	.66							6.27	
Mar. 27	4.17						1.24	1.04	.89		2.87	
Mar. 29	7.87						1.27	.76	.34		5.56	
Mar. 29	7.87						.89	.75	.59	.47	2.16	
Mar. 31	2.26	.77	.93	1.11	1.31	1.60	1.18	.98	.78	.76		
Means		.84	.89	1.07	1.31	1.60	1.18	.98	.78	.76		
Departures		.00	-.04	-.02	+.03	+.05	-.10	-.11	-.16	-.05		

BLUE HILL, MASS.

Mar. 2	3.6			0.93	1.07	1.27					3.3
Mar. 6	5.4						1.11	0.96	0.82		3.3
Mar. 7	2.2	0.82	0.93	1.11		1.55	1.31	1.14	.91		2.5
Mar. 9	2.0	.72	.88	1.07	1.30	1.59	1.35	1.20	1.06	.95	1.1
Mar. 11	2.4	.88	.95		1.19	1.32					2.4
Mar. 15	2.4					1.61	1.36	1.16	1.00	.92	2.4
Mar. 19	3.8	.97	1.07	1.18	1.31	1.44	1.25	1.08	.93	.80	4.6
Mar. 21	7.1			1.12	1.30	1.46					4.2
Mar. 22	2.9		.78	.92	1.07	1.27	1.03	.90	.88		3.8
Mar. 24	10.3					1.43	1.32			.99	6.8
Mar. 25	2.9				1.16	1.50	1.16	.95	.81	.70	2.3
Mar. 27	4.0					1.49	1.36				2.9
Mar. 28	2.4			1.04	1.29	1.59	1.22	.94	.74		2.9
Mar. 29	2.9			1.04	1.22	1.37					2.5
Means	.85	.92	1.05	1.21	1.45	1.26	1.06	.91	.86		
Departures	.00	-.01	-.03	-.01	+.04	+.05	+.02	-.04	.00		

TABLE 2.—Average daily totals of solar radiation (direct+diffuse) received on a horizontal surface

Week beginning—	Gram-calories per square centimeter																
	Wash- ington	Madi- son	Lin- coln	Chica- go	New York	Fresno	Fair- banks	Twin Falls	La Jolla	Miami	New Orleans	River- side	Blue Hill	San Juan	Friday Harbor	Ithaca	New- port
Feb. 26	cal. 217	cal. 224	cal. 212	cal. 158	cal. 260	cal. 298	cal. 126	cal. 250	cal. 230	cal. 392	cal. 372	cal. 238	cal. 276	cal. 566	cal. 271	cal. 224	cal. 299
Mar. 5	262	352	313	275	240	280	211	281	351	436	417	372	336	617	308	268	354
Mar. 12	167	309	288	248	171	403	208	205	468	445	348	409	202	654	225	222	211
Mar. 19	425	280	481	289	406	446	254	291	532	381	390	469	428	569	274	308	473
Mar. 26	273	376	397	351	233	586	341	437	504	469	356	419	331	625	402	255	373
Departures of daily totals from normals																	
Feb. 26	-70	-51	-122	-46	+12	-91	-16	-50	-166	+23	+80	-136	-30	+30	+120	-10	
Mar. 5	-48	+50	-42	+61	-18	-111	+49	-57	-24	+62	+105	-36	+30	+50	+111	+28	
Mar. 12	-150	-8	-81	+27	-89	-5	+10	-123	+48	+20	+14	+4	-75	+78	+29	+13	
Mar. 19	+90	-37	+88	+46	+109	-5	+64	-83	+52	-80	+29	+57	+49	-7	+43	+25	
Mar. 26	-75	+21	-5	+98	-48	+92	+48	+84	-11	+11	+45	+11	-68	+69	+93	-34	
Accumulated departures since Jan. 1																	
	-3,402	-3,430	-2,282	-56	-434	-2,107	+1,862	-4718	-651	-1,001	+2,464	-630	-1,456	+2,490	+3,227	-1421	